A STUDY ON THE NEONATAL OUTCOMES OF ELECTIVE CAESAREAN SECTION COMPARING BEFORE AND AFTER 39 WEEKS IN HOSPITAL SULTANAH NURZAHIRAH, KUALA TERENGGANU

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LISTS OF ABBREVIATIONS

- ACOG- American College Obstetric & Gyanecology
- ART- Assisted Reproductive Technique
- BMI- Body Mass Index
- CS- Caesarean Section
- DM- Diabetes Mellitus
- EL CS- Elective Caesarean Section
- HSNZ- Hospital Sultanah Nur Zahirah
- MAS- Meconium Aspiration Syndrome
- MRCOG- Membership of Royal College Obstetric & Gyanecology
- NHS- National Health Service
- NICU- Neonatal Intensive Care Unit
- NRP- Neonatal Resuscitation Programmed
- NSCA- National Sentinel Caesarean Section Audit
- POA- Period of Amenorrhea
- POG- Period of Gestation
- RDS- Respiratory distress syndrome; diagnosis required signs of respiratory distress, consistent with radiologic features and required oxygen therapy with fraction of inspired oxygen of 0.4 or greater for at least 24 hours or until death.
- SCN- Special Care Nursery
- SEA-ORCHID- South East Asia – Optimising Reproductive and Child Health in Developing Countries
- TTN- Transient tachypnea of newborn was defined by the presence of tachypnea within hours after birth
- VBAC – Vaginal Birth After Caesarean

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ABSTRAK

KAJIAN PERBANDINGAN KEADAAN BAYI YANG DILAHIRKAN MELALUI KAEDAH PEMBEDAHAN CAESAREAN ELEKTIF SEBELUM DAN SELEPAS 39 MINGGU KEHAMILAN DI HOSPITAL SULTANAH NURZAHIRAH, KUALA TERENGGANU

Pengenalan :

Kajian ini dijalankan adalah untuk menilai dan membandingkan keadaan bayi yang dilahirkan melalui kaedah pembedahan Caesarean elektif sebelum dan selepas 39 minggu kandungan. Kajian ini melibatkan kehamilan singleton dan tanpa komplikasi. Pembedahan elektif Caesarean adalah kaedah kelahiran secara pembedahan yang terancang sebelum tanda-tanda bersalin. Kelahiran secara pembedahan Caesarean elektif disarankan dilakukan pada atau selepas 39 minggu kehamilan kerana kajian sebelum ini menunjukkan meningkatnya risiko masalah pernafasan bayi sekiranya dilahirkan secara pembedahan sebelum kehamilan mencecah 39 minggu.

Objektif :

Tujuan kajian ini adalah untuk membandingkan keadaan bayi yang dilahirkan melalui kaedah pembedahan Caesarean elektif sebelum dan selepas 39 minggu dan menilai manfaat dan risiko dalam pembedahan selepas kehamilan 39 minggu.

Kaedah :

Kajian keratan rentas perbandingan ini mengambil masa setahun pada tahun 2012, melibatkan pengambilan 312 wanita dengan kehamilan singleton tanpa komplikasi, dan

mempunyai indikasi untuk kelahiran kaedah pembedahan Caesarean. Mereka dibahagikan kepada 2 kumpulan, pembedahan elektif Caesarean sebelum 39 minggu kehamilan dan pembedahan elektif Caesarean pada atau selepas 39 minggu kehamilan selepas kaunseling dan keizinan diberikan. Data yang dikumpul adalah data demografi dan keadaan ibu dan bayi semasa dan selepas kelahiran sehingga discaj daripada hospital.

Keputusan :

Perbezaan signifikan didapati antara kedua-dua kumpulan ini dari segi jumlah kemasukan bayi ke wad, bayi yang ditahan berpanjangan melebihi 48 jam, kadar morbiditi pernafasan bayi dan masalah-masalah neonatal yang lain. Jumlah kemasukan bayi ke unit rawatan neonatal bagi kumpulan sebelum 39 minggu adalah 46/156 bayi (29.5%) manakala bagi kumpulan pada atau selepas 39 minggu adalah 17/156 bayi (10.9%), dengan nilai $p < 0.005$. Bilangan bayi yang ditahan berpanjangan melebihi daripada 48 jam di unit rawatan neonatal bagi kumpulan sebelum 39 minggu adalah 30/156 bayi (19.2%) berbanding dengan kumpulan pada atau selepas 39 minggu adalah 7/156 bayi (4.5 %) dengan nilai $p<0.005$. Kadar morbiditi masalah pernafasan bayi bagi kumpulan sebelum 39 minggu adalah 19.2% (30/156 bayi) berbanding dengan kumpulan pada atau selepas 39 minggu adalah 6.4% (10/156 bayi) dengan nilai $p=0.001$ yang menunjukkan perbezaan yang signifikan. Bagi kumpulan sebelum 39 minggu terdapat 24 kes (15.4%) ‘TTN’ dan 6 kes (3.8%) ‘pneumonia’ kongenital manakala bagi kumpulan pada atau selepas 39 minggu terdapat 8 kes (5.1%) ‘TTN’ dan 2 kes (1.3 %) ‘pneumonia’ kongenital. Tiada perbezaan signifikan untuk min skor Apgar dan min analisis darah tali pusat untuk pH, tahap bikarbonat dan ‘base excess’ antara kedua-dua kumpulan. Masalah-masalah lain yang dikenalpasti ialah hipoglisemia, jaundis neonatal

dan jangkitan lain yang secara keseluruhan menunjukkan perbezaan antara dua kumpulan ini. Terdapat 2 kes kematian bayi dalam kajian ini yang melibatkan bayi daripada kumpulan sebelum 39 minggu.

Kesimpulan :

Kelahiran secara pembedahan elektif Caesarean sebelum 39 minggu kehamilan meningkatkan risiko kemasukan bayi ke unit rawatan neonatal, ditahan di wad berpanjangan (melebihi 48jam), morbiditi pernafasan bayi dan masalah-masalah neonatal yang lain. Oleh itu, kelahiran secara pembedahan elektif Caesarean disarankan dilakukan pada atau selepas 39 minggu untuk kehamilan singleton tanpa komplikasi.

ABSTRACT

Introduction:

This study evaluates the neonatal outcomes of elective caesarean section comparing before and after 39 weeks for term, uncomplicated singleton pregnancy. Elective caesarean section is a planned delivery in absence of labour and emergency deliveries due to specific maternal or fetal indication. Since there is evidence of increase risk in respiratory morbidity in the neonates that being delivered before 39 weeks, thus elective caesarean section is recommended to be done at 39 weeks or after for an uncomplicated singleton pregnancy.

Objective:

The aim of this study is to compare the neonatal outcomes in regards of delivery before 39 weeks and at 39 weeks and after; to evaluate the benefits and risk of delaying delivery in an elective caesarean section in Hospital Sultanah Nurzahirah, Kuala Terengganu.

Methodology:

A comparative cross sectional study conducted in period of a year time in 2012, involving recruitment of 312 patients through out the antenatal period, women with uncomplicated singleton pregnancy at term with an indication for elective caesarean section being included. They were divided into 2 groups, elective caesarean section before 39 weeks of gestation and elective caesarean section at and after 39 weeks of gestation; in which 156 patients per group. Data collected for demographic and outcomes measured involving both maternal and neonatal during and after the delivery

till discharge.

Results:

Significant difference seen in numbers of admission, prolonged hospitalization, rates of neonatal respiratory morbidity and neonatal adverse outcomes comparing the two groups. Admission to neonatal care unit for the group before 39 weeks was 46/156 neonates (29.5%) whereas in the group at 39weeks and after was 17/156 neonates (10.9%) with p value<0.005. Prolonged hospitalization more than 48 hours for the group before 39 weeks was 30/156 neonates (19.2%) compared to the group at 39 weeks and after was 7/156 (4.5%) with p<0.005. The rates of neonatal respiratory morbidity were 19.2% (30/156 neonates) and 6.4% (10/156 neonates) in the group before 39 weeks and at 39 weeks and after group, respectively; with p=0.001. There were 24 cases (15.4%) of TTN and 6 cases (3.8%) of congenital pneumonia were noted in the group before 39 weeks. There were 8 cases (5.1%) of TTN and 2 cases (1.3%) of congenital pneumonia in 39 weeks or after group. There was no significant difference in mean Apgar score, mean umbilical cord blood analysis for pH, bicarbonate level and base excess between both groups. The other neonatal adverse outcomes measured were hypoglycaemic episodes, neonatal jaundice and other infections, which showed difference in numbers between these two groups. There were 2 cases of neonatal mortality in this study involve group less than 39 weeks.

Conclusions:

Elective caesarean section before 39 weeks were associated with increased risk of admission to neonatal care unit, prolonged hospitalization, neonatal respiratory morbidities and neonatal adverse outcome. Therefore, 39 weeks of gestation appears to be the ideal timing for elective cesarean delivery for uncomplicated singleton pregnancy.

1.0 INTRODUCTION

Caesarean section (CS) is common performed operation in women that is globally increasing in prevalence each year. There are various indications for caesarean section mainly done either due to maternal or fetal indication. Previously, caesarean delivery performed only in cases of whereby immediate or urgent delivery need to be done in view of either maternal or fetal indication. However the concept of elective or planned caesarean section had come into across and being widely accepted currently.

Elective caesarean section (CS) is a planned caesarean delivery in absent of labour or emergency delivery in specific maternal or fetal condition. Elective CS rates have been increasing over the last ten to fifteen years, this increment mainly contributed by various factors, including the awareness of option and right of patient as per their higher educational level, they are more aware of their right (Gurol-Urganci et al. 2011).

Elective CS rates have been increasing in trend worldwide, rising from 5% of all birth in 1990 to 10% in 2008 and still increasing (Gurol-Urganci et al. 2011). 24% of Caesarean delivery involving primigravida with various indications; which lead to an increasing number of women with a previous CS. Some of them furthermore opted for elective repeat CS in preference of trial of vaginal delivery in their next pregnancy (Tita et al 2009).

From Jackson et al concluded that maternal request had been significant factors in the rise of CS (Jackson et al 1998).

In 2004, the National Institute for Clinical Excellence (NICE) recommended that an elective caesarean section for an uncomplicated pregnancy should not being carried out before 39 completed weeks due to increased the risk of respiratory morbidity in newborns (NICE guidelines April 2004).

Caesarean section carries maternal and neonatal benefits, risk and potential complications. Elective CS will avoid maternal risk of labour and delivery, including perineal trauma that may lead to urinary and anorectal problem and avoid the need of Emergency CS intrapartum. However it also carries risk and potential complications to mother either immediate or long term complications. For neonates, elective caesarean section will increase risk of respiratory morbidities compare to vaginal delivery (Luesly D et al 2010).

Risk of maternal mortality with non-elective caesarean deliveries is increased compared to elective ones. The Confidential Enquires into Maternal Death from 1997-1999 reported that there were significantly higher maternal mortality rate with emergency and urgent deliveries (Salim R et al. 2010).

Risk of neonatal respiratory morbidities is associated with Caesarean deliveries especially if it was performed in absence of labour, since physiological and hormonal changes in labour causing acceleration and evacuation of fetal lungs fluid. Failure of these mechanisms will lead to respiratory difficulty and require intensive care, mechanical ventilation and event surfactant (Aguilar AJ et al. 2011).

Early term infants appear to experience increased morbidity compared to infants born at or after 39 weeks. American College of Obstetricians and Gynaecologist (ACOG) suggest that non-urgent planned deliveries be scheduled at or after 39 weeks unless fetal lung maturity had been demonstrated. From a study by Claire et al. showed electively delivered infants were 46% more likely to be admitted to the Neonatal Intensive Care Unit (NICU) compare to infants born via non elective delivery, regardless mode of delivery and yet, these elective delivery were higher among Caesarean section group. Thus, elective delivery before 39 weeks poses a greater risk to the infant for admission to NICU (Claire et al. 2012).

Choosing timing of delivery in Elective Caesarean Section is importance to outweigh the benefits and risk. Since mid 1990's, various studies have been reported that elective CS performed before 39 completed weeks are associated with an increase likelihood of respiratory morbidity in newborns and admissions in neonatal intensive care, which has considerable economic cost as well psychological cost separating mother and baby right after delivery. Similar recommendations have been included in guidance from other countries and recent publications have been provided further evidence on the relation between timing of elective caesarean section and neonatal respiratory illness (Gurol-Urganci et al. 2011) .

An elective caesarean delivery at 38 weeks may results in the delivery of iatrogenically premature infant at risk of respiratory morbidity, while in the other hand delaying delivery to 39 weeks may results with spontaneous onset of labour with intrapartum complications. (Salim R et al. 2010)

Therefore choosing the correct time of delivery is crucial and have to to balance out maternal and fetal risk. Mothers had to understand the importance of timing of delivery and they should aware of the risk and potential complications to them and their babies on each decision that been made. These study being done to determine the ideal timing of delivery of the baby for cases of elective caesarean section and the outcomes of neonatal for each timing of delivery that been selected.

2.0 LITERATURE REVIEW

2.1 Overview on Caesarean Section

2.1.1 History of an Operative Delivery: Caesarean Section

History of Caesarean delivery was long and complex tale. Derivation of 'Caesarean' has been ascribed to several resources. Ancient historians, widely believed myth that a Roman emperor of Caesar- Gaius Julius Caesar was delivered from his mother via an abdominal incision, however no clear evidence to explain how the family of Gaius Julius Caesar received the cognomen Caesar and how this family name at some point became associated with a surgical procedure. Other possibility is the legend of an abdominal delivery became associated with the family name as an honour.

The name of "Caesar" came from Latin word meaning to cut, fall or to kill; to cut down or to strike mortally as in conflict' possibly reflecting a traumatic or surgical delivery sometime in the family past. Another possible origin of the term Caesarean derives from a legal response to the problem of perimortem or postmortem delivery, as part of life saving effort in the unusual circumstance of a dying or recently dead mother. By midsixteenth century the term Caesarean section was used to describe abdominal surgical deliveries in medical literature.

In 1610 a physician in Wittenberg, Jeremias Trautman conducted the earliest well documented caesarean delivery, however clinical details about it remains confusing and

unfortunately the mother died after day 25 post operation presumably because of infection. From the inception of operation, controversy concerning the propriety of caesarean delivery has characterized the medical literature, and it was a virtual death sentence for both mother and baby till early nineteenth century. Francois Mauriceau (1637-1709) the most celebrated Obstetrician in late 17th century argued only postmortem Caesarean should be performed, and her own sister also experienced serious antepartum hemorrhage secondary to bleeding placenta praevia, and he himself delivered her by podalic version and extraction however unfortunately she did not survive. (Patrick O'Grady J, 2008)

Caesarean delivery reported in 18th to mid 19th century with generally poor results and often loss both mother and fetus, many more reported cases showed high morbidity and mortality up 80% due to this procedure, and many inventions, surgical technique, suturing technique and material had been invented through out the line. Despite these and other innovations, Caesarean delivery did not gain popularity until after the introduction of aseptic technique by Joseph Lister (1827-1912) and after discovery of antimicrobials, in combination with improved anaesthesia and new surgical methods finally blunted the horrified rates of maternal morbidity. The introduction of lower segment caesarean incision with proposed dissecting into uterovesical fold resulted into less immediate surgical morbidity and substantially reduced the risk of uterine rupture in subsequent pregnancy and could avoid other complication rather than classical caesarean.

In recent decades additional modification in caesarean operative techniques have been introduce, however for the last 75 years, the most marked changes in caesarean section

are rapidly developed anaesthesia and administration of prophylactic antibiotics causing marked reduction in morbidity and mortality. Overall mortality had fallen to 1 per 1000 and even less owing to these advances and improvement. Now days, Caesarean had been considered as safe procedure with minimum mortality and morbidity.

2.1.2 Caesarean Delivery: Rate and Associated Risk Factor

Rate of caesarean delivery has increased dramatically over the last 20 years world wide initially remain 10% till 1965, by 1989 approximately 24%, overall now by 2008 25-30% varies by institutions. In 1994, the most widely recommended upper limit rate of caesarean section was 15 percent as advocated by the World Health Organization (WHO 1994). In United States, rate of caesarean section was increase from 20.1% in 1996 to 31.1% in 2006 (Tita et al. 2009).

The SEA-ORCHID (South East Asia – Optimising Reproductive and Child Health in Developing Countries) project across four South East Asian countries; Indonesia, Malaysia, Thailand and Philipines, found the average rate of caesarean section to be 27% (Mario R.festin et al. 2009).

There are associated risk factors that overall contributing towards increase Caesarean rate including repeat procedures and refusal of vaginal birth after caesarean (VBAC). Labour dystocia it self encounter 30% for repeat caesarean. The vigilance used of electronic fetal heart monitoring (EFM) with lead to uncertainties and variations in pattern recognition. This causing aggressive interpretation and with concern of medico legal aspect all these increasing the obstetric intervention for caesarean section. The

malpresentation including breech principally although techniques of external cephalic version being introduce, mother still opted for caesarean delivery.

Concern about malpractice litigation had contributed towards the rise in caesarean delivery. Other factor was the declining rate of operative vaginal deliveries while rapidly rising numbers of caesarean deliveries, and assuming of unwillingness of attending physician to attempt some instrumental deliveries.

Demographic factors also linked to increase in caesarean delivery, the frequency of caesarean deliveries increase with maternal age; 30 years and above. As more women now days start their families at age of 30's, they contribute to the rise in caesarean rate. In this group of women frequently cited as the explanation of increased medical complication and dysfunctional labour. Social factor as 'precious baby' or 'elderly primidgravida' who often pregnant by assisted reproductive technique (ART) also give rise to the increase operative delivery. An elective delivery via CS on maternal request also increasing in trend (Robson et al.2008)

2.1.3 Caesarean Section (CS): Elective versus Emergency

Elective CS principally done before the onset of parturition and a surgical procedure that scheduled in advanced. Indications are identified before the onset of labour thus scheduled for an operation to be done. Initially elective caesarean was remain controversial until recent years, more and more consensus slowly emerging that such procedure fall within acceptable practice, following full patient discussion and informed consent (ACOG Committee Opinion No 289).

Emergency CS is immediate delivery or urgent delivery in the presence of maternal or fetus life threatening condition or compromise whereby if the delivery not being done it will cause morbidity or even mortality for either or both mother and fetus (NICE guidelines 2004).

According to Van Ham et al, over the period of 10 years retrospective study on complications of CS, emergency CS showed a greater risk of maternal complications compare to elective procedures. Potential complications from either surgical or anaesthetic complications may occur more in emergency CS compare to elective CS, as the patient was not prepared for surgical operation. Thus, elective CS or planned CS had the advantages of reducing these morbidities. (Van Ham et al, 1997)